

EFFICIENT TECHNIQUES FOR SHARING A SECRET**ABSTRACT OF THE DISCLOSURE**

An n person secret sharing solution computes n unique keys to be distributed to the secret owners along with an exponentiated version of the secret. The custodian performs an exponent / modulo operation each time one of the keys is received from one of the secret owners. Alternatively, $n+1$ keys are created by the custodian, and the custodian retains one key after distributing the remaining n keys to the secret owners. After the custodian has received and processed the n keys from the secret owners, he performs an exponent / modulo operation using his own retained key. According to another aspect, a k out of n secret sharing solution involves computing and storing a database having an entry for each unique combination of k keys that could be returned from among the n keys. After k keys have been received, the custodian looks up in the database the entry corresponding to the particular unique combination of secret owners who returned keys. The custodian performs another exponent / modulo operation using the entry retrieved from the database in order to reconstruct the original secret. According to an embodiment, the custodian computes $n+1$ keys, distributes n of the keys to the secret owners, and keeps one of the keys for himself. The custodian retrieves his own key and performs a final exponent / modulo operation in order to reconstruct the original secret. According to another aspect, a k out of n secret sharing solution involves encrypting the original secret before applying any conventional k out of n secret sharing solution.

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